

**REMARKS**

This Supplemental Response contains additional discussion of the teachings of the Yamada reference (U.S. Patent No. 6,344,883 to Yamada et al.) cited by the Examiner in the final Office Action dated October 17, 2002. Specifically, Applicants provide remarks to further reveal that Yamada in no way teaches a dielectric frame that distorts electric field applied to the liquid crystal layer. Claims 1-37 stand rejected by the October 17, 2002 Final Office Action. Reexamination and reconsideration of the application are respectfully requested.

Claims 1-37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the related art shown in the application in view of U.S. Patent No. 6,344,883 to Yamada et al. (hereinafter Yamada '883). This rejection is respectfully traversed.

Claim 1 and claims 2-8, which depend from claim 1, are allowable over the cited references, in that none of the cited references, specifically Yamada '883, recites a combination of elements, including, for example, "wherein the first and second dielectric frames distort electric field applied to the liquid crystal layer". None of the cited references including Yamada '883, singly or in combination, teaches or suggests at least these features of the claimed invention. Accordingly, Applicants respectfully submit that independent claim 1, and claims 2-8, which depend from claim 1, are allowable over the cited references.

Claims 9 and claims 10-19, which depend from claim 9, are allowable over the cited references, in that none of the cited references, specifically Yamada '883 nor the '117 patent, recites a combination of elements, including, for example, "wherein at least one of the first, second and third dielectric frames distort electric field applied to the liquid crystal layer". None of the cited references including Yamada '883, singly or in combination, teaches or suggests at least these features of the claimed invention. Accordingly, Applicants respectfully submit that independent claim 9, and claims 10-19, which depend from claim 9, are allowable over the cited references.

The previous Office Actions received in the present application assert that Yamada '883 discloses, among other things, a dielectric frame, 36 (OMR83). A careful examination of

Yamada '883 reveals that OMR83 is in fact a photoresist. (Col. 25, lines 28-30). It seems that the Examiner is taking Official Notice that a photoresist is a dielectric. Applicant respectfully submits the Examiner may take official notice of facts outside of the record, which are capable of instant and unquestionable demonstration as being "well-known" in the art. However, as set forth in MPEP 2144.03, if an applicant traverses an assertion made by an Examiner while taking Official Notice, the Examiner should cite a reference in support of their assertion. Accordingly, Applicants respectfully traverses the use of the Official Notice rejection in the present Office Action. The Office Actions provided thus far in this application summarily conclude that a photoresist must be a dielectric. Applicants request that the Examiner provide a reference teaching such a conclusion.

Moreover, nothing in Yamada '883 teaches or suggests a dielectric frame distorting electric field as recited by at least independent claims 1 and 9 of the present application. Yamada '883 teaches distortion of the liquid crystal molecules by varying the thickness of the liquid crystal layer, not distorting an applied electric field. A careful examination of Yamada '883 reveals how Yamada '883 proposes to achieve the desired result of "axis-symmetrically aligned" liquid crystal molecules. While the previous Office Actions have referred to a section comprising eight consecutive columns of Yamada '883, Applicants wish to point to specific teachings of Yamada '883 to illustrate the teachings of the reference:

"The axis-symmetrical alignment is formed with good reproducibility by controlling the *thickness* of the liquid crystal layer as described above." (Col. 14, lines 42-45).

"The convex portions 36 are formed for the purpose of controlling the *thickness* of the liquid crystal layer 40 and weakening the interaction of the liquid crystal molecules between the pixel regions." (Col. 13, lines 49-50).

"Because of the convex portions 36, the liquid crystal layer 40 has two different *thicknesses*  $d_{out}$  and  $d_{in}$ . As a result, upon the application of a voltage for forming axis-symmetrical alignment central axes (described later), liquid crystal regions exhibiting axis-symmetrical alignment are defined by the convex portions 36. The formation of the convex portions 36 defines the positions and sizes of the

liquid crystal regions exhibiting axis-symmetrical alignment. The detail of the convex portions 36 is as described in Embodiment 1.” (Col. 20, lines 13-22 (referring to Col. 12, line 10 to Col. 18, line 7)).

“According to the present invention, because of the convex portions 36, a plurality of central axes in axis-symmetrical alignment (hereinafter merely referred to as “central axes”) are formed in liquid crystal regions exhibiting axis-symmetrical alignment defined by the convex portions.” (Col. 20, lines 58-63).

Throughout the disclosure of Yamada ‘883, it is clear that spatial distortion and spatial disruption of the bonds between liquid crystal molecules are the mechanism for the axis-symmetrical alignment. Tellingly, Yamada ‘883 makes no mention of *distortion* of electric field, as recited by the claims of the present application.

Moreover, Applicants submit that the photoresist mentioned in Yamada ‘883 cannot be relied upon for its arguable dielectric properties to control the central axis of the liquid crystal, because other structures besides the photoresist can be used to vary the thickness of the liquid crystal layer, e.g. the homeotropic alignment layer, to achieve the desired result. Yamada ‘883 clearly teaches:

“As described above, the cross-sectional shape (thickness) of the homeotropic alignment layer is changed to vary the thickness of the liquid crystal layer 40 as described with reference to FIGS. 4A and 4B, whereby the positions of central axes in axis-symmetrical alignment can be controlled, and the axis-symmetrical alignment can be realized with good reproducibility.

In the example shown in FIG. 5A, although the thickness of the liquid crystal layer 40 is controlled by the cross-sectional shape of the homeotropic alignment layer 58a, the method for controlling the thickness of the liquid crystal display device 40 is not limited thereto.” Col. 15, lines 14-25.

In conclusion, Applicants submit that any distortion in alignment of the liquid crystal molecules taught or suggested by Yamada ‘883 is purely because of spatial distortion of the

liquid crystal molecules and that nothing in the cited references teaches or suggests a dielectric frame distorting electric field applied to the liquid crystal layer. Contrary to the Examiner's continued assertion, there is no teaching in Yamada '883 that the "convex portions", whether made of photoresist or not, have any affect on the electric field applied to the liquid crystal. Moreover, no reference that would teach or suggest any dielectric properties of a photoresist has been provided. Therefore, Applicants submit that the Examiner has not met his burden to present a *prima facie* case of obviousness under 35 U.S.C. § 103 and respectfully request withdrawal of the rejections based on Yamada '883.

Applicant submits that Claims 20-37 are allowable over the cited references in that each of these claims recites a combination of elements, including, for example, "a third insulating protrusion between the first and second insulating protrusions and acting as a spacer between the first and second substrates" as recited in independent claim 20. Accordingly, Applicants respectfully submit that independent claim 20 and claims 21-37, which depend from independent claim 20, are allowable over the cited references.

Applicants therefore believe the foregoing amendments and remarks place the application in condition for allowance and early, favorable action is respectfully solicited.


Should the Examiner deem that a telephone conference would further the prosecution of this application, the Examiner is invited to call the undersigned representative at (202) 496-7500.

If these papers are not considered timely filed by the U.S. Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. § 1.136, and any additional fees required under 37 C.F.R. § 1.136 for any necessary extension of time, or any other fees required to

complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to Deposit Account No. 50-0911. A duplicate copy of sheet is enclosed.

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Respectfully submitted,

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